POSSIBILITIES OF CYBERNETICS IN THE

RESOLUTION OF LEGAL PROBLEMS

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At the present time, cybernetic study
methods, following their use in natural sciences, are
penetrating into the realm of humanities. This is witnessed
by such a rapidly developing branch of linguistics as
machine translation. In certain foreign countries the
development of the problem of the application of cyberne-
tics to the resolution of legal problems has already been
attacked. Thus, at the International Conference for stan-
dards on a common language for machine searching and trans-
lation, that took place in the city of Cleveland (USA) in
September 1959, a report was presented by Prof. L. E. Allen

on a mechanical procedure for detecting and controlling syntactic ambiguities in the discourses of both sides in a case on trial. The report attempted to establish one of the possible ways in which cybernetic instruments could serve

the needs of jurisprudence. (L. E. Allen. "Toward a procedure for detecting and controlling of syntactic ambiguity in legal discourse". International conference for standards on a common language for machine searching and translation, Cleveland, Ohio, September, 1959, pages 6-12). Despite the timeliness of this report, in our opinion it is necessary to point out the somewhat limited manner of the posing of the problem and the inadequate link to the practical requirements of jurisprudence.

It is known that a number of problems arise in law that require a considerable expenditure of intellectual labor, and the resolution of which might be significantly speeded up by the use of highspeed cybernetic installations. Such problems include: a reference information service in the field of law, certain problems of enactment of legislation, codification of laws, standardization of judicial practice, the conduct of documented criminal investigations and so forth.

In the resolution of the numerous problems of enactment of legislation, codification, interpre-

tation and application of law, a rapid and precise method of orientation in the most varied and fairly broad spheres of lawmaking is required. As shown by actual practice, this may be properly ensured only by the availability of an efficient reference-information service. The best and and most complete form of such a service would be a specialized cybernetic machine for law that could, firstly accumulate and summarize a virtually unlimited volume of legal information, covering not only the-all-union and the separate republics legislation of our country, but the legislation of other socialist countries, as well as, and to the extent necessary, that of capitalistic countries and international law, and, secondly, make any part of the accumulated information available on demand.

In a period of active building of communism, broad masses of soviet citizens take part in the creation and discussion of the most important projects for legislative action. In the process of the national discussion of projects for legislation the laboring people put forward a large number of concrete wishes, comments and proposals the object of which is the proper resolution of problems of law enforcement.

The complete and considered consideration of all the wishes and proposals put forward by the laboring

people, likewise may be ensured by the use of cybernetic machines. Naturally, the actual consideration of such proposals will remain within the competence of the enacting power, but all of the preliminary technical work may be speeded up considerably by the use of cybernetic machines. At the same time, cybernetic machines could provide for the orderly storage of all matters pertaining to the discussion of projected legislation, that for one reason or another, are not reflected in the new laws, but that could be useful in the discussion of other future projects.

Of great importance in the resolution of a series of problems arising in the course of enactment of legislation is the comparative analysis of the content, the form and the regulatory features of the law project under consideration and the methods and regulatory features for analogous social relations embodied in the legal systems of other countries or other historical periods. This work, as a rule, requires much expenditure of time and, because of the vastness of the material that must be analyzed, it is far from often sufficiently complete and exact. In order to help achieve this objective, cybernetic machines could be used, capable of sorting out the necessary data from the mass of accumulated material, for the benefit of the enacting power. In most cases such a selection will be accomplished

along established criteria, that would be fixed in the reference-information machine. It is possible, however, that the enacting power will require new special criteria, criteria that could vary significantly from one case to the other. For the resolution of such types of problems, it will be necessary to equip the reference-information machine with control arrangement capable of accomplishing various combinations of operations, in addition to the established and constantly utilized minimum.

At the present time, the problem of codification of soviet legislation is extremely timely. Codification of laws presupposes the conduct of a series of preliminary operations on legislative material: determination of the legislative material that must be codified; segregation of legislatve acts that have been formally abolished by the appropriate organs; segregation of acts the statute of limitations on which has passed and has not been renewed, as well as acts which, although not formally abolished, have ceased to be applicable due to later legislation. A number of similar operations must be accomplished also within the provisions of the legislative acts that are being codified. Furthermore, they must be subjected to appropriate amendments: for example, certain articles must be excluded from the text that list acts that are being abolished; also

articles that have a single application or that are of a personal nature. It is also necessary to eliminate repetitions and contradictions between and within the acts that are being codified, and to bring together acts or articles within appropriate acts that are similar in content, etc.

The adoption of cybernetic machines for the accomplishment of various unwieldy secondary operations, connected with the preparation of a codification of laws, emphasizes the need of equipping the machnine with varying selection criteria for legislative material, as well as criteria by means of which contradictions and repetitions as between acts (and articles) are located, together with statutes of limitation, limitations of applicability by sphere of action, type of persons or other specific characteristics. All of this confronts a cybernetic machine destined to service legal needs, as well as its controlling arrangement with requirements worthy of serious consieration.

Prospects are good for the use of cybernetic machines for the preparation of material on the generalization of legal practice. The volume of information available in this branch of jurisprudence, greatly exceeds that encountered in other branches of law. By means of machines, the fullest accumulation and preliminary systematizing of factual material covering an enormous number of legal

cases may be accomplished, together with a disclosure of most prevalent errors repeated in legal practice. It would also be possible to derive statistical indices regarding various types of breaches of the law and types of crimes.

Fihally, cybernetic machines may be widely used in various types of legal expertise: for the legal verification of accounting practice, for checking the authenticity of documents in accordance with previously given official indications, the establishment of the authorship of documents by style and graphic characteristics and for other similar operations.

The use of cybernetics in the resolution of the above mentioned and other types of legal problems, will require much preparatory work. In the first place, an information language must be developed in the areas of law in which it is proposed to apply this technique, or for legislative and other material that it is proposed to subject to a preliminary operation by means of computers.

A cybernetic machine carries out operations with coded numbers. Any operation involving the digest of information by a machine, constitutes some rearrangement of the numbering codes of the information (for example, the addition of a suffix to to the root in a machine translation is accomplished by the addition of certain numbers

to the number representing the root of the word). Any
information, therefore, including legal information, must
be fed into the machine in coded form. The legal informa-
tion fed into the cybernetic machine, therefore, must be
prepared in accordance with the problems put to the machine.
The operations accomplished by the machine for the resolu-
tion of legal problems requires the development of a system
of numbering symbols (algorithms). The development of an
algorithm presupposes the existence of a well constructed
symbolic language for the noting down of this algorithm.
In connection with this construction of an information
language in the case of law, it would be appropriate to
start with the establishment of an effective symbols system –
– a system of signs and rules for using these signs – that
would make it possible, after the legal information has
been digested, to write down any algorithms in an exact
command language. Thereafter, the transition to a numbering
code for machine operation will no longer present much dif-
ficulty.

The symbolic language used in writing down the
algorithm, with the addition of a symbols dictionary of
the legal concepts being examined, including acts and sta-
tutes, in its totality forms a complete language for the
noting of juridical information in a cybernetic machine.

Such complete languages are usually known as information languages.

In connection with the development of an information language for law, at least five specialized problems come up. First of all, it is necessary to develop a s y s t e m   o f   c r i t e r i a in accordance with which all the legal material fed into the machine will be classified. For exmaple, in organizing the memory of the reference-information machine, the laws of a certain country must be identified by means of the same   code (different for every country) and stored in fixed memory units. This will enable the receipt in a speedy and simple manner of all information regarding the legislation of a given country on demand. Each legal statute must have its own special unchanging code, stored in fixed sections of a memory unit. Finally, it would be possible to utilize simultaneously both coded cruteria and obtain all of the information for the law statute of a given country that is of interest to us.

Naturally, the criteria according to which the machine operates, could be most varied and could be utilized in the most varied combinations. Such a system of criteria could include, for example, legal practices standard for a given region of the country, the application of standard legal practices to specific population groups, organs,

organizations and officials, the limitations of legal prac-
tice according to age, sex, family position, etc.

In this specific case, the selection of informa-
tion to be fed into the machine is first accomplished by
specialists, and the machine thereafter does not modify the
volume of information that has been fed into it. By contrast,
the problems that we will examine below, are connected with
the i n t r o d u c t i o n   i n t o   t h e   m a c h i n e
o f   s p e c i f i c   s e l e c t i o n   c r i t e r i a ,
by means of which the machine will admit into its memory
units only information needed by the user of the machine.
Obviously, in this case the volume of information stored
in the machine will be, as a rule, considerably smaller
than the volume fed to it.

The selection criteria (in the same way as the
systematizing criteria of the preceding problem) may be
quite varied. The simplest one is the criterion that deter-
mines the application of legal statutes in time. This brings
us to the second specialized type of problems, the resolu-
tion of which will enable us to establish which of the
legal acts or articles that have been fed to the machine
are no longer in force and which are still active. In par-
ticular, in codifying law the machine will be able rapidly
of
to xxxx seggregate from the mass/legislative material fed

to it, the statutes or articles that have either been
nullified by subsequent legislation, or the statute of limi-
tations for which has expired. The problem here consists
in devising a system of criteria that would kx characterize
the period during which legislation is in force, to develop
a methodology that would permit the extraction of these
criteria in the course of a machine analysis of a legal text,
establish algorithms that would relate the criteria to
each other and come up with a conclusion regarding the
need to maintain or discard specific legal provisions.

„Another selection criterion consists in the
internal
verification of legislative material to eliminate/repeti-
tion. The machine could, in a very short time examine a
vast amount of materail and expose repetitions both as to
form and as to substance (even with a certain degree of
difference in formulation). Thus, for example, in the pre-
paration of a legal project it is sometimes proper to
consider whether parts of a given provision are entirely
or partially repetitive of existing legislation. In this
case, the machine could, of course, only establish the
existence of such repetitions. The decision as to whether
the repetitive provisions should stand because of their
importance and which should be discarded, is that of the
lawmaking organ. In such cases the special rpoblem comes

down to the development of a so-called coded condensation

of the material, i. e. to the establishment of specific

methods of designating portions of legal documents, a method

that will permit the machine to uncover the coinciding

sections of legal documents.

The next selection criterion consists in

a verification of the material fed to the machine for

contradictions. As an illustration we may cite graphic

machine expertise in legal cases. In this case the machine

is fed xxiyxx first a portion of the text, that is analyzed

by means of an electric scanning device and in accordance

with a given program, as a result of which there appear in

the machine's memory characteristic graphic peculiarities

of the text (handwriting). The successive introduction

into the machine of other portions of the text will permit

the machine to bring out whether xhxxxxhxx these coded chara-

cteristics are the same for all proptions of the text that

have been introduced, or whether, on the contrary, certain

portions have different characteristics, and are, therefore,

in a different handwriting. It is easy to conclude from the

above that such problems really come down to the establish-

ment of a system of characteristics , a deviation from which

would be sufficient to qualify the contradictory nature of

the material as being internal.

Finally, it is possible to select the material
fed into the machine from the standpoint of its conformity
or nonconformity with data permanently stored in it.
An example could be the situation in which a machine has
in long term storage information that consists in the
summary of the total amount of certain/~~quotations with the~~
decisions of the plenary
Supreme tribunal of the USSR, and all decisions and sen-
tences of actual legal cases"are subjected to the algorithm
by which they are compared with the decisions of the
plenary of the Supreme tribunal of the USSR. For the resolu-
tion of this and similar type problems, it is necessary to
develop a system of criteria by means of which it will be
possible to establish the conformity or nonconformity as
compared with the permanently stored information and that
which is fed into the machine for comparison with it. An
algorithm for the identification of the conformities and non-
conformities also must be developed.

The totality of the special problems
outlined here are by no means exhaustive of the general
problem of application of of the modern cybernetic technique
for legal needs. Nevertheless, even in this initial stating
of the problem, it will be seen to be so broad and varied
in aspect, that it cannot but attract the attention of the
scientific community.

We are far from thinking that the application
of mathematical instruments and of all that is connected
with the use of cybernetic installations in the resolution
of legal problems will modify the substance of science, of
law. The application of cybernetics to the resolution of
legal problems is but a tool in the hands of man, who in
all cases preserves for himself the function of selecting
one of several alternatives and the power of decision.
A machine generally cannot replace man, especially in the
sphere of government and law, where the responsibility for
every decision, for each action, is precisely that of
the people. At the same time, under modern conditions,
the broad utilization of the powerful auxiliary that
cybernetics offers us, is quite appropriate. It is clear
that the resolution of many legal problems with the help
of the cybernetic technique will require, first, the accom-
plishment of important preparatory work (creation of an
information language for law, the construction of specia-
lized cybernetic machines), and, second, the training of
personnel well versed in problems of jurisprudence, in the
logical-linguistic digest of information and in other
problems of cybernetics. At the present time the first
steps in this direction have been made in the Leningrad
university. There has been created a pioneer group of

scientific workers, fellows and students that has commenced
preliminary work in the creation of an information language
for law. It is obvious, however, that the successful conti-
nuation of such research depends on ~~the~~ attracting/to this
additional effort
promising and especially interesting work, both in terms
of a broadening of research by introducing it into other
scientific centers, and by placing this research on a
deeper and more solid base.

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2166